

## The Bern IVF Cohort: Perinatal outcomes compared to the general population of Switzerland

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**Background:** In Switzerland, 2.5% (n=2162 in 2016) of children are born following In vitro fertilisation (IVF). Research shows that IVF babies have worse perinatal outcome compared to spontaneously conceived babies. In Bern, the IVF Cohort was set up to investigate the perinatal period and the health of children born after IVF.

**Methods:** The Bern IVF Cohort includes women age 18-42, treated by different IVF therapies at the Bern University Hospital and their children. We offer Natural Cycle IVF (NC-IVF) without hormonal stimulation or modified Natural Cycle IVF (mNC-IVF) as an alternative to classical IVF (c-IVF). In c-IVF, we use gonadotropin doses  $\geq 150$  IE/d. In mNC-IVF we use drugs to reduce the risk for premature ovulation such as ibuprofen or clomiphene or single GnRH antagonist injections. In mild stimulation IVF (m-IVF) we use low gonadotropin doses ( $<150$  IE/d). All women had a fresh cleavage stage embryo transfer between 2010-2016 and a pregnancy thereafter. We compared perinatal outcomes of singletons born alive of the IVF – Cohort to the outcomes of the Swiss General Population provided by the Federal Statistical Office.

**Results:** In the IVF Cohort n=395 woman are included with 488 pregnancies; whereof 190 were miscarriages or biochemical pregnancies and 298 deliveries (272 singletons inc. 3 perinatal death, 25 twins, 1 triplet) with 269 singletons born alive. 70 (26%) singletons were born after NC-IVF, 74 (27.5%) after mNC-IVF, 40 (14.9%) after m-IVF and 85 (31.6%) after c-IVF.

Mean age of mothers at first delivery after IVF was 35.21 (SD 3.94) compared to 31.9 years in the general population. 75.1 % of the mothers after IVF gave birth to their first child. Mean birthweight in our cohort was 3272.45 g (SD 560.3 g), whereof 6.3% (n=18) were born with a birthweight below 2500g. In the general population, mean birthweight of all live births was 3288.31 g (including multiples) and 4.6% of singletons were born below 2500g. Mean birthweight percentile in the cohort was 41.25 (SD 27.2). Mean gestational age in the cohort was 39.1 (SD 1.81) and 6.7% were born before week 37 of gestation compared to 5.9% in the Swiss General Population.

After IVF treatment, more women (42%; n=113) had a cesarean section (CS) compared to the general population (33.2% in year 2016). After IVF treatment 35% (n=90) had induction of labor. Of 113 having had a cesarean section after IVF, 62 had a planned CS (55.9%), 49 had a secondary CS after start of labor and two were unknown.

Only 3% of mothers smoke during pregnancy following IVF treatment.

**Conclusion:** Perinatal outcomes of children after IVF differ from the general population of Switzerland. We know that perinatal factors may influence health in later life. It is important to find out more about these associations, the causes for them and if they are related to IVF, treatments or other confounding factors such as for example age and health of parents.